

What is claimed is:

1 ~~1. A method of establishing a network connection, the~~  
2 ~~method comprising:~~  
3 ~~establishing a connection across a first communication~~  
4 ~~network that carries audio signals;~~  
5 ~~encoding a computer network address for a specified~~  
6 ~~network different from the first network into an encoded~~  
7 ~~network address and sending the encoded network address~~  
8 ~~across the first network; and~~  
9 ~~using said network address to establish a network~~  
10 ~~connection on said second network.~~

1 ~~2. The method of claim 1, where the first network~~  
2 ~~comprises a voice telephone network.~~

1 ~~3. The method of claim 2, where the encoded network~~  
2 ~~address is encoded using dual tone multi-frequency signals.~~

1 ~~4. The method of claim 1, where the encoded network~~  
2 ~~address is appended to telephone network signaling data.~~

1 ~~5. The method of claim 1, where the second network~~  
2 ~~comprises an Internet.~~

1        6. The method of claim 1, where the computer network  
2 address comprises an Internet protocol address.

1        7. The method of claim 1, where the computer network  
2 address includes a port address.

1        8. The method of claim 1, further comprising:  
2        receiving a stream of audio signals;  
3        sending the audio signals through the connection across  
4 the voice telephone network prior to said using said network  
5 address to establish a network connection; and  
6        sending the audio signals through the connection across  
7 the computer network after said using said network address  
8 to establish a network connection.

1        9. The method of claim 1, further comprising:  
2        receiving a stream of audio signals;  
3        encrypting the audio signals using a first computer  
4 that is connected to the second network to form encrypted  
5 audio signals; and  
6        sending the encrypted audio signals across the first  
7 network connection.

1        10. The method of claim 1, further comprising:  
2        transmitting an encryption key across the second  
3 network using the network connection;  
4        encrypting an audio signal using the encryption key to  
5 form an encrypted audio signal; and  
6        transmitting the encrypted audio signal across the  
7 first network.

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1        11. A method of establishing a network connection, the  
2 method comprising:  
3        establishing a first connection across a voice  
4 telephone network between a first location and a second  
5 location;  
6        encoding a computer network address for a specified  
7 computer network different from the voice telephone network  
8 into an encoded network address and sending the encoded  
9 network address across the voice telephone network from the  
10 first location to the second location; and  
11        establishing a second connection between the first  
12 location and the second location across the computer network  
13 using the computer network address.

1       12. A method of establishing a network connection, the  
2 method comprising:

3       establishing a first connection across a voice  
4 telephone network between a first location and a second  
5 location;

6       receiving an encoded network address at said second  
7 location, from the voice telephone network for a computer  
8 network that is different than the voice telephone network;

9       translating the encoded network address to a computer  
10 network address; and

11       establishing a second connection between the first  
12 location and the second location across the computer network  
13 using the computer network address.

1       13. A computer program stored on a computer-readable  
2 medium, for establishing a network connection, the computer  
3 program including instructions operable to cause a computer  
4 to:

5       obtain a computer network address for a computer  
6 network;

7       send the computer network address across a second  
8 network different than the computer network; and

9 receive a network connection request to establish a  
10 network connection across the computer network, and using  
11 the computer network address sent across the second network  
12 to establish the network connection.

14. A computer program stored on a computer-readable  
medium, for establishing a network connection, the computer  
program including instructions operable to cause a computer  
to:

encode a computer network address for a specified  
computer network different from a communications network  
that carries audio signals into an encoded network address  
and send the encoded network address across the  
communications network; and

use said computer network address to establish a  
network connection on said computer network.

15. A method of encrypting a voice conversation, the  
method comprising:

establishing a connection across a voice communication  
network between a first party and a second party;

establishing a connection across a computer network  
between the first party and the second party;

7 transmitting an encryption key across the computer  
8 network so that both said first and second parties have said  
9 encryption key;  
10 encrypting an audio signal using the encryption key;  
11 and  
12 transmitting the encrypted audio signal across the  
13 voice telephone network.

1 16. The method of claim 15, where establishing a  
2 connection across a computer network comprises:  
3 encoding a computer network address into an encoded  
4 network address;  
5 sending the encoded network address across the voice  
6 communication network; and  
7 using the encoded network address to establish a  
8 connection across the computer network.

1 ~~17~~. A computer program stored on a computer-readable  
2 medium, for encrypting a telephone conversation, the  
3 computer program including instructions operable to cause a  
4 computer to:  
5 establish a first connection across a computer network  
6 between a first party and a second party;

7 transmit an encryption key across the computer network  
8 so that both said first and second parties have said  
9 encryption key;  
10 encrypt an audio signal using the encryption key; and  
11 transmit the encrypted audio signal across a voice  
12 communication network using a second connection between the  
13 first party and the second party.

1 ~~18.~~ A method of authenticating a telephone call  
2 between a calling telephone and a receiving telephone, the  
3 method comprising:  
4 establishing a connection across a voice communication  
5 network between a calling telephone and a receiving  
6 telephone;  
7 establishing a connection across a computer network  
8 between a calling computer and a receiving computer; and  
9 verifying that the calling computer is coupled to the  
10 calling telephone by sending a signal from the receiving  
11 telephone to the calling telephone across the voice  
12 communication network and sending the signal from the  
13 calling computer to the receiving computer across the  
14 computer network.

1        19. The method of claim 18, further comprising  
2 authenticating the calling computer.

1        20. The method of claim 18, where verifying the  
2 caller's computer is coupled to the calling telephone  
3 comprises:

4        generating a random number;

5        sending the random number to the calling telephone  
6 across the voice telephone network;

7        receiving the encrypted random number at the receiving  
8 computer across the computer network;

9        decrypting the encrypted random number using a public  
10 cryptographic key; and

11       comparing the random number with the decrypted random  
12 number.

1        21. The method of claim 18, where establishing a  
2 connection across a computer network comprises:

3        encoding a computer network address into an encoded  
4 network address;

5        sending the encoded network address across the voice  
6 telephone network; and



7 receiving a network connection request to establish a  
8 connection across the computer network, where the network  
9 connection request uses the computer network address.

1 22. The method of claim 18, where establishing a  
2 connection across a computer network comprises:

3 receiving an encoded network address across the voice  
4 telephone network;

5 translating the encoded network address to a computer  
6 network address; and

7 sending a network connection request to establish a  
8 connection across the computer network, where the network  
9 connection request uses the computer network address.

1 ~~23~~. A method of authenticating a telephone call  
2 between a calling telephone and a receiving telephone, the  
3 method comprising:

4 establishing a connection across a voice communication  
5 network between a calling telephone and a receiving  
6 telephone;

7 establishing a connection across a computer network  
8 between a calling computer and a receiving computer; and

9        verifying that the receiving computer is coupled to the  
10 receiving telephone by sending a signal from the calling  
11 telephone to the receiving telephone across the voice  
12 communication network and sending the signal from the  
13 receiving computer to the calling computer across the  
14 computer network.

1        ~~24.~~ A computer program stored on a computer-readable  
2 medium, for authenticating a telephone call between a  
3 calling telephone and a receiving telephone, the computer  
4 program including instructions operable to cause a computer  
5 to:

6        establish a connection across a computer network  
7 between a calling computer and a receiving computer; and  
8        verify the calling computer is coupled to a calling  
9 telephone using both a voice telephone network and the  
10 computer network.

1        ~~25.~~ A crossbar switch, comprising:  
2        a switch including at least one analog input port, at  
3 least one digital input port, at least one analog output  
4 port, at least one digital output port, and a processor

5 which generates digital signals based upon analog signals  
6 received at said at least one analog input port;

7 at least one analog input channel which receives an  
8 audio signal, where each analog input channel is coupled to  
9 a corresponding analog input port of the switch;

10 at least one digital input channel, where each digital  
11 input channel is coupled to a corresponding digital input  
12 port of the switch;

13 at least one analog output channel, where each analog  
14 output channel is coupled to a corresponding analog output  
15 port of the switch;

16 at least one digital output channel, where each digital  
17 output channel is coupled to a corresponding digital output  
18 port of the switch; and

19 a control element coupled to the switch,

20 where the control element is adapted to control which  
21 of the analog input ports, digital input ports, analog  
22 output ports, and digital output ports are active,

23 where an active input port sends a signal received at  
24 the input port from a coupled channel into the switch, and  
25 an active output port sends a signal from within the switch  
26 to a coupled channel, allowing a signal received at any

27 input port of the switch to be sent to one or more channels  
28 coupled to corresponding output ports of the switch.

1        26. An audio crossbar switch, comprising  
2        a plurality of input ports, where one input port is  
3 coupled to an audio source;  
4        a plurality of output ports, where one output port is  
5 coupled to a telephone network, and one output port is  
6 coupled to a computer network; and  
7        a control element which physically connects at least  
8 one input port to at least one output port and can  
9 dynamically change which input port is coupled to which  
10 output port.

1        27. The audio crossbar switch of claim 26, where the  
2 audio source is a telephone.

1        28. The audio crossbar switch of claim 26, where the  
2 control element can change a connection between the audio  
3 source and the telephone network to a connection between the  
4 audio source and the computer network without terminating a  
5 telephone conversation occurring through the connection  
6 between the audio source and the telephone network.

1        ~~29~~. An audio crossbar switch, comprising:  
2        an audio input port for receiving an audio signal;  
3        a plurality of output ports, where one output port is  
4 coupled to a telephone network, one output port is coupled  
5 to a computer network, and one output port is coupled to a  
6 computer; and  
7        a control element, where the control element is adapted  
8 to control and switch in real-time which one or more of the  
9 output ports the audio signal transmits the audio signal.

1        ~~30~~. An article comprising:  
2        a storage medium having stored thereon instructions  
3 which, when executed by a computing device, result in:  
4        encoding a computer network address for a  
5 specified computer network different from a communications  
6 network that carries audio signals into an encoded network  
7 address and send the encoded network address across the  
8 communications network; and  
9        using said computer network address to establish a  
10 network connection on said computer network.